

Name: _____

Math 10F&PC H.

Date: _____

Chapter Ch.5 Relations and Functions

5.3 - Interpreting and Sketching Graphs

Review: For the function $f(x) = -3x^2 - 4$ determine

a) $f(4)$

$$f(4) = -3(4)^2 - 4$$

$$= -48 - 4 = -52$$

b) $f(-3)$

$$f(-3) = -3(-3)^2 - 4$$

$$= -27 - 4 = -31$$

c) $f(x) = -16$

$$-16 = -3x^2 - 4$$

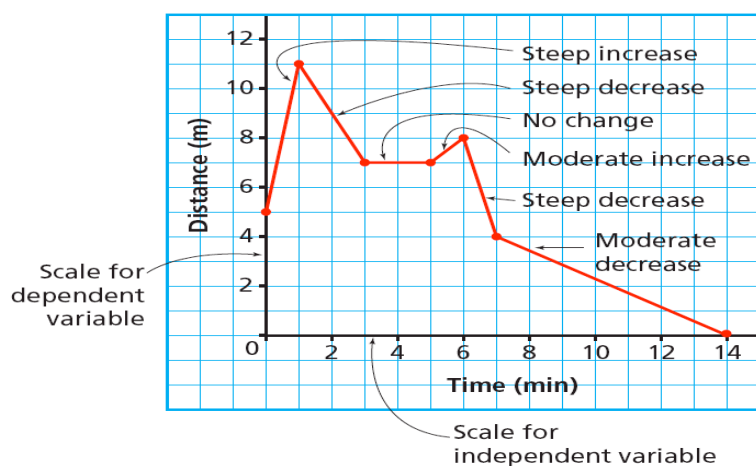
$$-12 = -3x^2$$

$$x^2 = 4 \quad x = \sqrt{4} = \boxed{\pm 2}$$

Graphs can provide much information

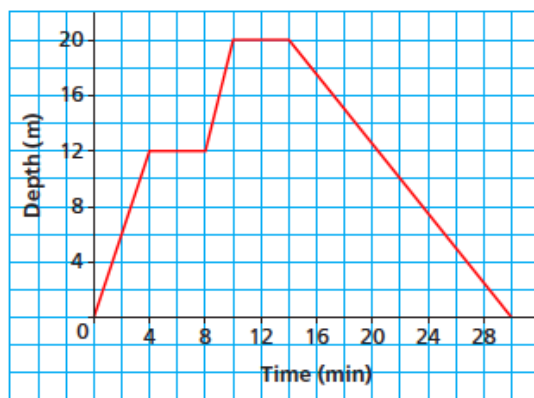
- Look at title, and axis labels to gather as much info as possible
- Think of realistic reasons for what is happening in the graph

Properties of a Graph



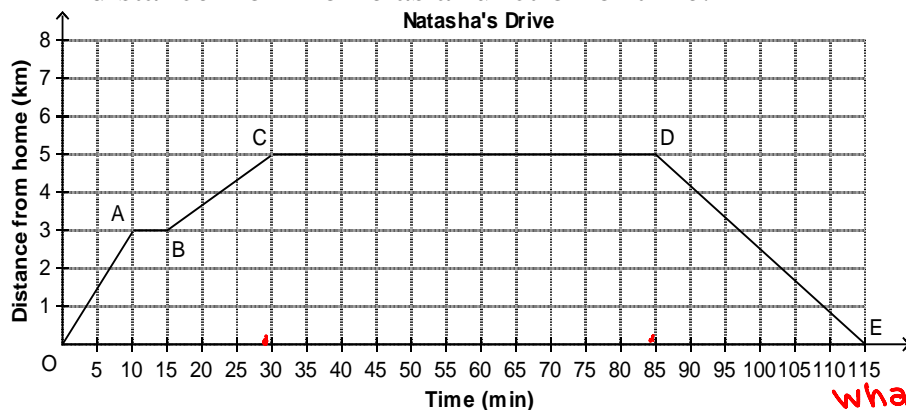
Example 1: Consider the following graph:

A Scuba Diver's Dive



- A) How many minutes did the dive last?
It last for 30 mins
- b) At what times did the diver stop her descent?
Stopped between (4min - 8 min) and between (10 min - 14 min)
- c) What was the greatest depth the diver reached? For how many minutes was the diver at that depth?
* the greatest depth = 20 m.
* For 4 minutes

Example 2: Natasha spent part of the afternoon running errands. This graph shows her distance from home as a function of time.



what was her ave. speed

a) How far did Natasha drive in total?

the total distance = $(5 \text{ km})(2) = 10 \text{ km}$

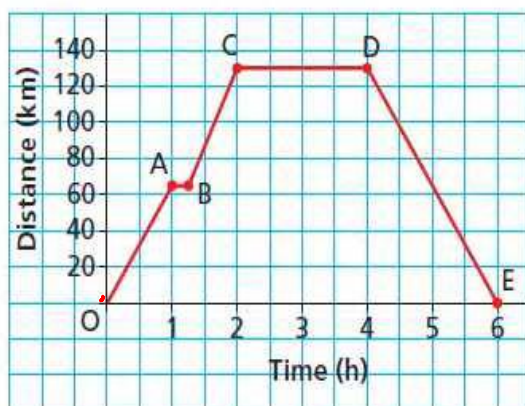
b) How long was Natasha away from home?

the total time = 115 mins

$$\therefore \frac{10 \text{ km}}{115 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} = \boxed{5.217 \text{ km/hr}}$$

Example 3: This graph represents a day trip from Winnipeg to Winkler. The distance is approximately 130 km.

Day Trip from Winnipeg to Winkler, Manitoba

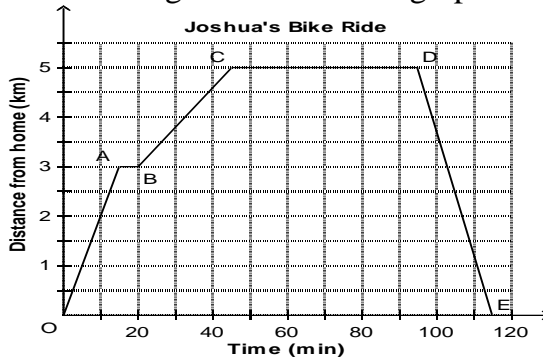


The distance between Winnipeg and Winkler is 130 km.

a) Describe the journey for each segment of the graph.

Segment	Graph	journey
\overrightarrow{OA}	<ul style="list-style-type: none"> the graph goes up to the right As the time increases, the distance increases 	* traveled 65 km in the first hour of the trip.
\overrightarrow{AB}	<ul style="list-style-type: none"> the graph is horizontal as the time increases, the distance does not change. 	* the car stopped for 15 min
\overrightarrow{BC}	<ul style="list-style-type: none"> the graph goes up to the right As the time increases, the distance increases 	* traveled for 45 mins to cover a distance of 65 km
\overrightarrow{CD}	<ul style="list-style-type: none"> the graph is horizontal, as the time increases, the distance does not change. 	* they arrived in Winkler after traveling 130 km in 2 hrs.
\overrightarrow{DE}	<ul style="list-style-type: none"> the graph goes down to the right, as the time increases distance decreases. 	* they traveled back to Winnipeg - 130 km in 2 hours

Example 4: Joshua went on a bike ride. Which statement best describes what is happening for line segment DE in this graph?



- a. Joshua spends time at the park. b. Joshua leaves home.
c. Joshua cycles to the park. d. Joshua returns home.

Example 5: if $f(x) = -5x + 3$ and $g(x) = 2x - 3$. Find

$$(f + g)(x) = (-5x + 3) + (2x - 3) = \boxed{-3x}$$

$$(f - g)(x) = (-5x + 3) - (2x - 3) = \boxed{-7x + 6}$$

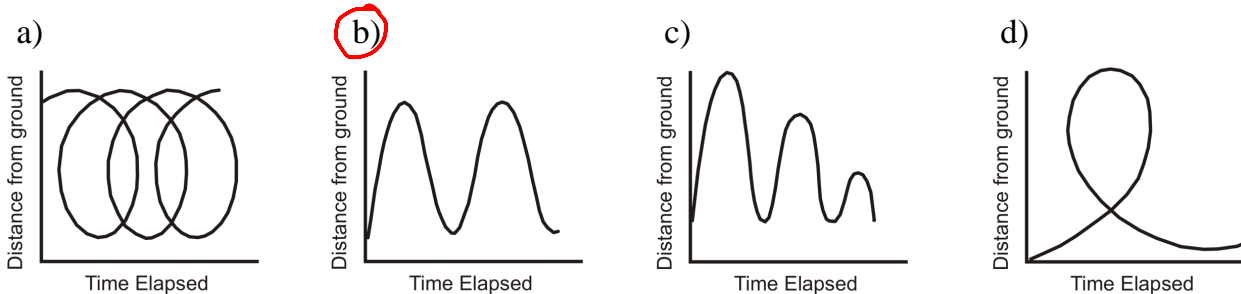
$$(f \cdot g)(x) = (-5x + 3)(2x - 3) = -10x^2 + 15x + 6x - 9 = \boxed{-10x^2 + 21x - 9}$$

$$(f/g)(x) = \frac{-5x + 3}{2x - 3}$$

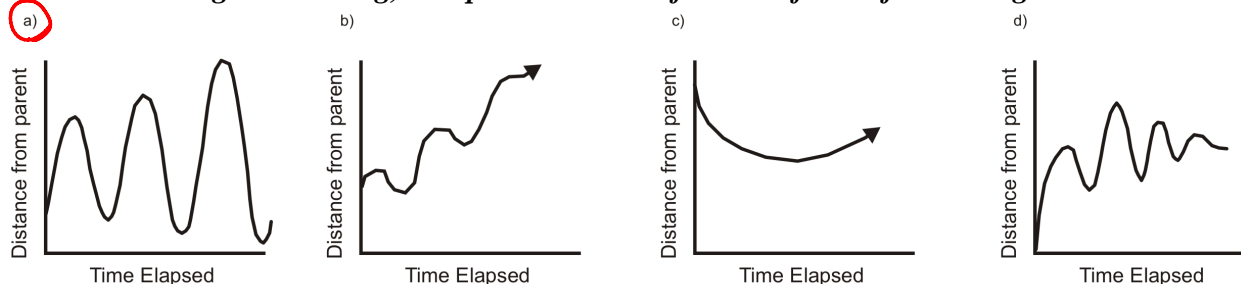
$$f(g(x)) = -5(2x - 3) + 3 = -10x + 15 + 3 = \boxed{-10x + 18}$$

Example 6: Indicate which graph matches the statement. Give reasons for your answer.

1. A bicycle valve's distance from the ground as a boy rides at a constant speed.



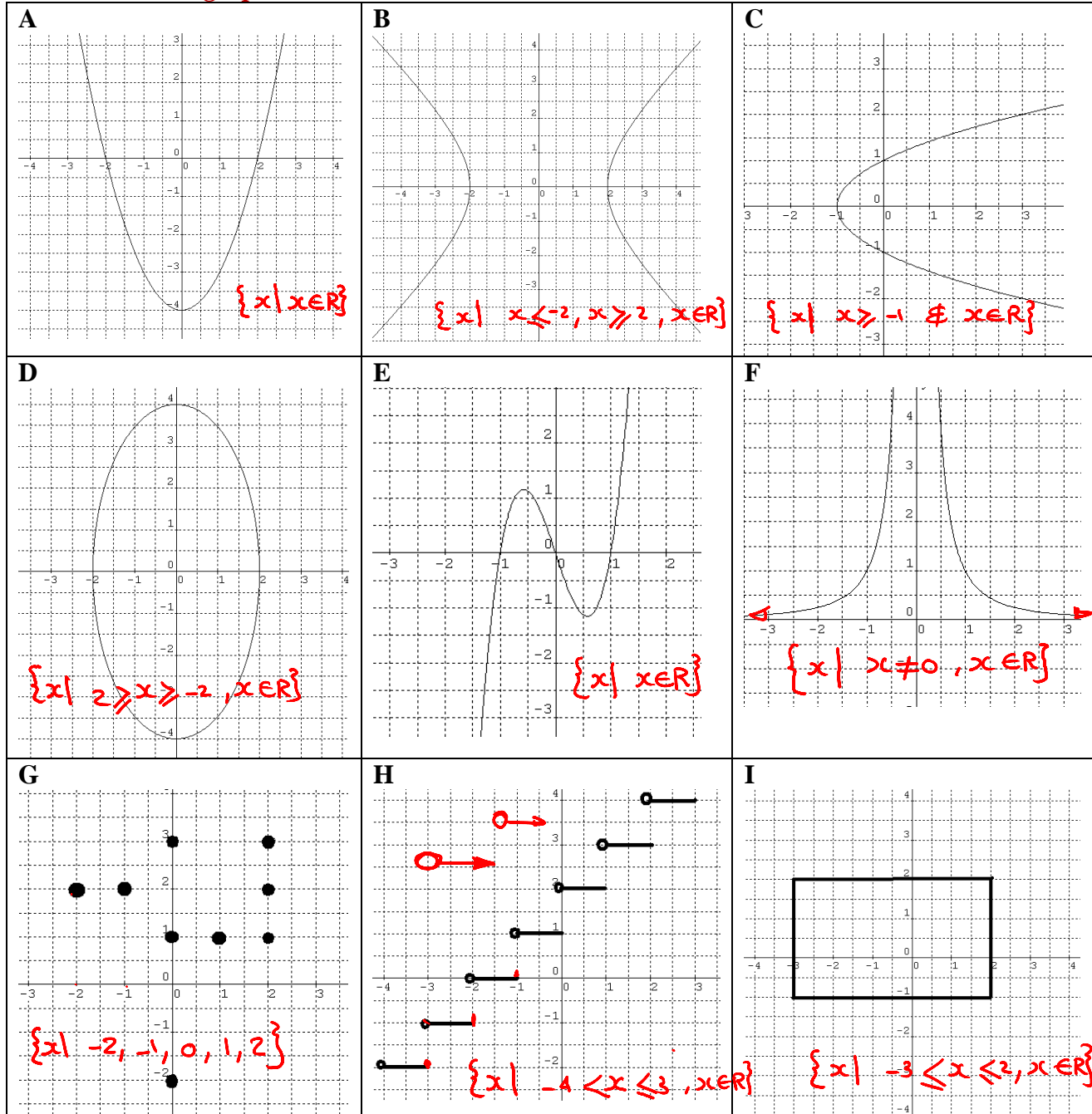
2. A child swings on a swing, as a parent watches from the front of the swing.



Assignment: p. 281 Q #3–7, 9–11, 13

Domain and Range Matching Activity

Match each graph with its domain



a. $\{x \neq 0, x \in \mathbb{R}\}$	b. $\{-3 \leq x \leq 2, x \in \mathbb{R}\}$	c. $\{x \geq -2, x \in \mathbb{R}\}$
d. $\{x \in \mathbb{R}\}$	e. $\{-2 \leq x \leq 2, x \in \mathbb{R}\}$	f. $\{-2, -1, 0, 1, 2\}$
g. $\{x \in \mathbb{R}\}$	h. $\{x \leq -2, x \geq 2, x \in \mathbb{R}\}$	i. $\{x \in \mathbb{R}\}$